



**PROJECT PROFILE**

## Makah Tribe, Native American Lands Environmental Mitigation Program (NALEMP) Technical Support, Neah Bay, Washington

Ridolfi has been working with the Makah Tribe since 1999 to investigate and clean up former military sites on the Makah Indian Reservation. This comprehensive effort includes: conducting historical research and field reconnaissance to identify and delineate facilities constructed and operated by the U.S. Department of Defense (DoD); developing and updating the Strategic Project Implementation Plan (SPIP) for mitigation of military impacts based on Tribal priorities; preparing Sampling and Analysis Plans (SAP); conducting site investigations and characterizing contaminants at impacted sites; producing site investigation reports; assessing impacts to natural resources and cultural resources; developing work plans for removal and remedial actions; preparing requests for proposals for remediation contractors; conducting oversight of removal actions and site cleanups; producing removal and remedial action reports to document cleanup actions; and preparing documents to support no-further-action determinations for sites where cleanup and restoration are complete.

This environmental mitigation work has been conducted under cooperative agreements between the Makah Tribe and the DoD using funding provided by the Native American Lands Environmental Mitigation Program (NALEMP).

**Strategic Project Implementation Plan (SPIP).** Ridolfi compiled and organized historical information and field data to produce the Tribe's first SPIP in 2001. Ridolfi has since assisted the Tribe in updating the SPIP which identifies the sites impacted by past military use and details current site conditions and cleanup status. The SPIP allows the Makah Environmental Restoration Team to prioritize project work when developing new cooperative agreements with the DoD.

**Investigations and Removal Actions on Wa'adah Island:** Ridolfi has worked with the Makah Tribe since 1998 to investigate and cleanup former military impacts on Wa'adah Island. In 2009, a site investigation was conducted to evaluate contamination in surface soils around four metal Quonset huts on the south end of the Island. PCS and PAH-contaminated soils with concentrations above screening levels were found.

In 2014, four Quonset huts, three munitions bunkers, and associated creosote-treated timber foundations were removed from Wa'adah Island. Overall, 40 cubic yards of

asbestos-contaminated metal, 20.6 tons of lead-contaminated metals, and 61.5 tons of contaminated soil were disposed of off reservation. A total of 40 tons of metal debris was removed from the island and recycled. A 2-inch asbestos-wrapped wire cable was discovered during this field effort. In 2018 additional mitigation activities were conducted, including the removal of approximately 50 cubic yards of PAH-contaminated soil and investigation of the asbestos-wrapped wire cable to prepare for future removal.

**Semi-Annual Monitoring.** Ridolfi has conducted monitoring of groundwater, surface water, and sediments since 2003 at the former Makah Air Force Station Cantonment Area (now the Makah Tribal Center). Sampling events are conducted twice a year in the spring and fall. Groundwater samples are collected from six monitoring wells, and surface water and sediment samples are collected from three locations along Cub Creek, a tributary to the Wa'atch River. The on-going environmental monitoring is used to evaluate environmental impacts from contamination due to past military activities.

Groundwater samples are analyzed for petroleum hydrocarbons, BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and lead. Surface water and sediment samples are analyzed for petroleum hydrocarbons, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbon (PAHs), polychlorinated biphenyls (PCBs), pesticides, and metals. Results are interpreted to identify trends in contamination concentrations and migration toward the Wa'atch River.



Ridolfi scientist collecting sediment samples from Cub Creek.



**Mitigation of Former Housing Units.** Since 2000, Ridolfi has worked with the Makah Tribe to conduct site inspections, develop removal action plans, and remove aboveground storage tanks (ASTs), USTs, PCS, ACM, and LBP in the former Makah Air Force Station Family Housing Area. Once hazardous materials were removed, the abandoned houses were removed. To date, 16 ASTs and one UST have been removed from the site, along with approximately 20 tons of associated PCS. A total of 15 houses have been demolished, and the demolition was disposed of off the reservation. Ridolfi assisted in selecting the contractors for asbestos abatement and demolition and provided oversight and clearance for asbestos abatement.



**A remediation contractor applies water to demolition work at the Family Housing Area to limit hazardous dust exposure.**

**Mitigation Efforts at the Navy Lifeboat Station.** Since 2003, Ridolfi has worked with the Makah Tribe to mitigate military impacts at the Navy Lifeboat Station. The site contained a barracks complex, a garage, and a gymnasium that were deconstructed and removed in 2005. Prior to deconstruction, Ridolfi inspected the facilities for ACM and LBP to prevent exposure to workers and releases to the environment.

The ACMs were removed prior to building deconstruction, and materials containing LBP were identified and segregated to minimize disposal costs. Ridolfi assisted in selecting the asbestos abatement contractor and provided oversight and clearance for asbestos abatement.

A total of 2.5 cubic yards of ACM were abated from five buildings before deconstruction. Approximately 800 cubic yards of building debris and 138 cubic yards of PCS were removed. Additionally, three ASTs, four USTs, and 30 55-gallon barrels were removed from the site.

**Investigations and Remediation Efforts on Tatoosh Island.**

Tatoosh Island was formerly occupied by three federal agencies including the U.S. Navy. Ridolfi has worked with the Makah Tribe since 2005 to conduct site investigations and remediation efforts to address the extensive military impacts on Tatoosh Island. Samples of soil, asbestos-containing material (ACM), and lead-based paint (LBP) have been collected and submitted for laboratory analysis during 10 different events. To date, over 600 cubic yards of petroleum-contaminated soil (PCS) and 300 cubic yards of lead-contaminated soil have been removed from Tatoosh Island. Additionally, three dilapidated buildings and nine abandoned underground storage tanks (USTs) have been removed. Ridolfi is currently working with the Makah Tribe to develop a site investigation of the Navy-impacted areas of the Island to support development of a mitigation plan to remediate and restore lead contaminated soil.



**Helicopter removing contaminants from Tatoosh Island**